WHAT IS CLAIMED IS:

1.   A system for controlling an automatic transmission for an internal combustion engine, the transmission comprising a gear shift mechanism to which motive force of the engine is transferred through a fluid coupling, the mechanism comprising first and second friction engaging elements, wherein a shifting from a first gear ratio to a second gear ratio is carried out by releasing a first hydraulic pressure of the first friction engaging element for disengagement thereof and supplying a second hydraulic pressure to the second friction engaging element for engagement thereof, the second hydraulic pressure being subjected to a feedback control, the system comprising:

a sensor which senses a parameter on a vehicle cruising condition; and

an electronic control unit (ECU) which is operative in response to the sensed parameter, the ECU comprising:

a part which calculates, in accordance with the sensed parameter, a difference in output-side rotational speed of the fluid coupling before and after the shifting; and

a part which sets, when the shifting is carried out with an output of the engine being smaller than a predetermined value, the second hydraulic pressure in accordance with the calculated difference immediately before start of the feedback control.

2.   The system as claimed in claim 1, wherein the parameter of the sensor comprises a vehicle velocity.

3.   The system as claimed in claim 1, wherein the second hydraulic pressure has an initial value determined in accordance with torque acting on the output side of the fluid coupling immediately before start of the feedback control, the initial value being corrected in accordance with the calculated difference in output-side rotational speed.

4.   The system as claimed in claim 3, wherein the initial value of the second hydraulic pressure is greater in an area where the calculated difference in output-side

rotational speed is smaller than in an area where the calculated difference is greater.

5.   The system as claimed in claim 3, wherein the initial value of the second hydraulic pressure is held substantially constant in an area where the calculated difference in output-side rotational speed is smaller than a predetermined value, whereas the initial value is decreased with increasing the calculated difference in an area where the calculated difference is greater than the predetermined value.

6.   The system as claimed in claim 3, wherein the ECU comprises a map set previously for correction of the initial value of the second hydraulic pressure.

7.   An automatic transmission for an internal combustion engine, comprising:
a fluid coupling;
a gear shift mechanism to which motive force of the engine is transferred through the fluid coupling, the mechanism comprising first and second friction engaging elements, wherein a shifting from a first gear ratio to a second gear ratio is carried out by releasing a first hydraulic pressure of the first friction engaging element for disengagement thereof and supplying a second hydraulic pressure to the second friction engaging element for engagement thereof, the second hydraulic pressure being subjected to a feedback control;
a sensor which senses a parameter on a vehicle cruising condition; and
an electronic control unit (ECU) which controls the fluid coupling and the gear shift mechanism, the ECU being programmed to:
calculate, in accordance with the sensed parameter, a difference in output-side rotational speed of the fluid coupling before and after the shifting; and
set, when the shifting is carried out with an output of the engine being smaller than a predetermined value, the second hydraulic pressure in accordance with the calculated difference immediately before start of the feedback control.

8.   The automatic transmission as claimed in claim 7, wherein the parameter of the sensor comprises a vehicle velocity.

9.   The automatic transmission as claimed in claim 7, wherein the second hydraulic pressure has an initial value determined in accordance with torque acting on the output side of the fluid coupling immediately before start of the feedback control, the initial value being corrected in accordance with the calculated difference in output-side rotational speed.

10.   The automatic transmission as claimed in claim 9, wherein the initial value of the second hydraulic pressure is greater in an area where the calculated difference in output-side rotational speed is smaller than in an area where the calculated difference is greater.

11.   The automatic transmission as claimed in claim 9, wherein the initial value of the second hydraulic pressure is held substantially constant in an area where the calculated difference in output-side rotational speed is smaller than a predetermined value, whereas the initial value is decreased with increasing the calculated difference in an area where the calculated difference is greater than the predetermined value.

12.   The automatic transmission as claimed in claim 9, wherein the ECU comprises a map set previously for correction of the initial value of the second hydraulic pressure.

13.   A method of controlling an automatic transmission for an internal combustion engine, the transmission comprising a gear shift mechanism to which motive force of the engine is transferred through a fluid coupling, the mechanism comprising first and second friction engaging elements, wherein a shifting from a first gear ratio to a second gear ratio is carried out by releasing a first hydraulic pressure of the first friction engaging element for disengagement thereof and supplying a second hydraulic pressure to the

second friction engaging element for engagement thereof, the second hydraulic pressure being subjected to a feedback control, the method comprising:

sensing a parameter on a vehicle cruising condition;

calculating, in accordance with the sensed parameter, a difference in output-side

5   rotational speed of the fluid coupling before and after the shifting; and

setting, when the shifting is carried out with an output of the engine being smaller than a predetermined value, the second hydraulic pressure in accordance with the calculated difference immediately before start of the feedback control.

10   14.   The method as claimed in claim 13, wherein the parameter of the sensor comprises a vehicle velocity.

15.   The method as claimed in claim 13, wherein the second hydraulic pressure has an   initial   value   determined   in accordance with torque acting on the output

15   side of the fluid coupling immediately before start of the feedback control, the initial value being corrected in accordance with the calculated difference in output-side rotational speed.

16.   The method as claimed in claim 15, wherein the initial value of the second

20   hydraulic pressure is greater in an area where the calculated difference in output-side rotational speed is smaller than in an area where the calculated difference is greater.

17.   The method as claimed in claim 15, wherein the initial value of the second hydraulic pressure is held substantially constant in an area where the calculated

25   difference in output-side rotational speed is smaller than a predetermined value, whereas the initial value is decreased with increasing the calculated difference in an area where the calculated difference is greater than the predetermined value.

18.   The method as claimed in claim 15, wherein there is provided a map set

previously for correction of the initial value of the second hydraulic pressure.